

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

97-001

INSTRUCTIONS

1. The preparing activity must complete blocks 1,2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

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I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-STD-2500A	2. DOCUMENT DATE (YYMMDD) 941012
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3. DOCUMENT TITLE

National Imagery Transmission Format

4. NATURE OF CHANGE

(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)

Two controlled tags to the NITF 2.0 specification Mil-Std-2500A and NITF 2.1 specification Mil-Std-2500B. The first provides information needed for printing and scaling. The second provides information for map projections. (See attached document.)

The configuration management home of the tags will be either the Mil-Std-2500 Annex B Registry or the proposed CIO Tag Document.

5. REASON FOR RECOMMENDATION

This information is not currently available within the NITF standards or controlled TAGs (See attached document).

6. SUBMITTER

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8. PREPARING ACTIVITY

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The following are registration submissions for two controlled tags to the NITF 2.0 specification Mil-Std-2500A and NITF 2.1 specification Mil-Std-2500B. This submission follows the form laid out on the JITC/NITFS Web page located at http://jitc-emh.army.mil/nitf/tag_reg/tag3.htm#detailed.

The tag, ERDASM, was registered with Coliean Cioca of TASC, Inc. on Aug 17, 1995. The tag contents is now being submitted to the NTB as two controlled tags because it is felt the entire NITF community would benefit from its availability.

1. Identification of the submitting organization and phone number of for a point of contact for the submission.

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3. Purpose and general description of the proposed tag

A. Tag “BACKGD”

This tag will provide the information needed by NITF to print and scale an NITF composition (images and annotation). It supplies the unpack software with a composition size (within a C-level), the printing pixel size (the composition scale factor), and a background color.

B. Tag “PROJCT”

This tag will provide the information needed by NITF for full map projection utilization with non square and non uniform pixels. This will allow a much more accurate geo-location of pixels than the data provided by the NITF image sub-header or current extensions.

4. Rationale and justification for including the submission within the NITFS.

Both “BACKGD” and “PROJCT” will provide the data needed by the NITF standards for mapping facilities to produce quality maps.

5. Copy of the documentation defining the tagged record extension to be registered.

The configuration management home of the tags will be either the Mil-Std-2500 Annex B Registry or the proposed CIO Tag Document.

5.A) Tag “BACKGD”

If the XHD field of the main header contains "BACKGD" then:

The ability to use this tag shall be optional for Packing (export) and required for Unpacking (import).

Table I Tag BACKGD: Map Composition Information.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
CETAG	Tag name	6	“BACKGD”	R
CEL	Tag length	5	104	R
VER	Tag version	5	“01.00”	R
BGWIDTH	The width, in pixels, of the complete NITF composition (This is not the C-level size, this is the composition (e.g., paper) size.)	8	0-99999999	R
BGHIGHT	The height, in pixels, of the complete NITF composition (This is not the C-level size, this is the composition (e.g., paper) size.)	8	0-99999999	R
BGRED	The red component of the background	8	0-255	R
BGGREEN	The green component of the background	8	0-255	R
BGBLUE	The blue component of the background	8	0-255	R
PIXSIZE	The number of pixels per PIXUNITS: “INCHES” or “CENTIMETERS” only	8	0-99999999	R
PIXUNITS	The unit of measure for printing of a pixel of the NITF composition	40	Alphanumeric: “DEVICE PIXELS”, “INCHES”, “CENTIMETERS” or “POINTS”	R

Note the PIXSIZE is defined for PIXUNITS of “INCHES” or “CENTIMETERS” only:

If the PIXSIZE is 100 and the PIXUNITS is “INCHES” the NITF composition units of measure for printing is 100 pixels per inch (the same logic is true for “CENTIMETERS”).

If the PIXUNITS is “DEVICE PIXELS” then the composition is output to the print device with a one to one pixel correspondence.

If the PIXUNITS is “POINTS” the composition units of measure for printing is 72 pixels per inch or 28.3464 pixels per centimeter.

5.B) Tag “PROJCT”

If the IXSHD field of the image header contains "PROJCT" then:

In Table II all PROPARMn's are specified in USGS General Coordinate Transformation Package form.

* In the following tables a value in the Value Range column of “Real ASCII” is defined as: -4.94065645841246544e-324 to 1.79769313486231570e+308 (based on IEEE-754)

Table II Tag PROJCT: Projection Information

FIELD	NAME	SIZ E	VALUE RANGE	TYPE
CETAG	Tag Name	6	“PROJCT”	R
CDL	Tag Length	5	686 - 99999	R
VER	Tag version	5	“01.00”	R
PRONAME	Projection name	200	Alphanumeric	R
PROCNTI	Integer projection parameters count	4	0-9999	R
PROPRMI1	First Integer projection parameter	11	+/-2** ³¹ -1 (+/-4147483647)	C
.....				
PROPRMIn	Integer projection parameter n	11	+/-2** ³¹ -1 (+/-4147483647)	C
PROCNTR	Real projection parameters count	4	0-9999	R
PROPARM 1	First Real projection parameter (in USGS GCTP form)	29	Real ASCII*	C
.....				
PROPARM nn	Nth Real projection parameter (in USGS GCTP form)	29	Real ASCII*	C
SPHEROID	Name of the Spheroid	200	Alphanumeric	R
SEMIMAJ	Semi-major axis of Spheroid	29	Real ASCII*	R
SEMIMIN	semi-minor axis of Spheroid	29	Real ASCII*	R
DATUM	Name of the datum	200	Alphanumeric	R
DATUMCN T	Datum parameters count	4	0-9999	R
DATUM1	First Datum parameter	29	Real ASCII*	C
.....				
DATAUMn	Nth datum parameter	29	Real ASCII*	C

The parameter contents of this table are specified in Tables III and IV.

5.B.1 Projection Parameters

Each of the following sections defines the projection parameters for Table II. The datum and spheroid data follow in Table III.

Projection 1

PRONAME: "Geographic (Lat/Lon)"
PROCNTI: 0
PROCNTR: 0

Projection 2

PRONAME: "UTM"
PROCNTI: 2
PROPRMI1: UTM Zone
PROPRMI2: -1, 1
where: 1 == (North of the equator)
-1 == (South of the equator)
PROCNTR: 0

Projection 3

PRONAME: "State Plane"
PROCNTI: 2
PROPRMI1: State Plane Zone
PROPRMI2: NAD
PROCNTR: 0

Projection 3

PRONAME: "Albers Conical Equal Area"
PROCNTI: 0
PROCNTR: 6
PROPARM1: Latitude of 1st standard parallel in decimal degrees
PROPARM2: Latitude of 2nd standard parallel in decimal degrees
PROPARM3: Longitude of central meridian in decimal degrees
PROPARM4: Latitude of origin of projection in decimal degrees
PROPARM5: False easting at central meridian in meters
PROPARM6: False northing at origin in meters

Projection 4

PRONAME: "Lambert Conformal Conic"
PROCNTI: 0
PROCNTR: 6
PROPARM1: Latitude of 1st standard parallel in decimal degrees
PROPARM2: Latitude of 2nd standard parallel in decimal degrees
PROPARM3: Longitude of central meridian in decimal degrees
PROPARM4: Latitude of origin of projection in decimal degrees

PROPARM5: False easting at central meridian in meters

PROPARM6: False northing at origin in meters

Projection 5

PRONAME: "Mercator"

PROCNTI: 0

PROCNTR: 4

PROPARM1: Longitude of central meridian in decimal degrees

PROPARM2: Latitude of true scale in decimal degrees

PROPARM3: False easting at central meridian in meters

PROPARM4: False northing at origin in meters

Projection 6

PRONAME: "Polar Stereographic"

PROCNTI: 0

PROCNTR: 4

PROPARM4: Longitude directed straight down below pole of map in decimal degrees

PROPARM5: Latitude of true scale in decimal degrees

PROPARM6: False easting in meters

PROPARM7: False northing in meters

Projection 7

PRONAME: "Polyconic"

PROCNTI: 0

PROCNTR: 4

PROPARM4: Longitude of central meridian in decimal degrees

PROPARM5: Latitude of origin of projection in decimal degrees

PROPARM6: False easting at central meridian in meters

PROPARM7: False northing at origin in meters

Projection 8

PRONAME: "Equidistant Conic"

PROCNTI: 0

PROCNTR: 6 or 7, based on the value of PROPARM5

PROPARM1: Longitude of central meridian in decimal degrees

PROPARM2: Latitude of origin of projection in decimal degrees

PROPARM3: False easting in meters

PROPARM4: False northing in meters

PROPARM5: 1 or 2, One or two standard parallels

if PROPARM5 == 1 then

 PROPARM6 Latitude of standard parallel in decimal degrees

if PROPARM5 == 2 then

 PROPARM6 Latitude of 1st standard parallel in decimal degrees

 PROPARM7 Latitude of 2nd standard parallel in decimal degrees

Projection 9

PRONAME: "Transverse Mercator"

PROCNTI: 0

PROCNTR: 5

PROPARM1: Scale factor at central meridian

PROPARM2: Longitude of central meridian in decimal degrees

PROPARM3: Latitude of origin of projection in decimal degrees

PROPARM4: False easting in meters

PROPARM5: False northing in meters

Projection 10

PRONAME: "Stereographic"

PROCNTI: 0

PROCNTR: 4

PROPARM1: Longitude of center of projection in decimal degrees

PROPARM2: Latitude of center of projection in decimal degrees

PROPARM3: False easting in meters

PROPARM4: False northing in meters

Projection 11

PRONAME: "Lambert Azimuthal Equal-area"

PROCNTI: 0

PROCNTR: 4

PROPARM1: Longitude of center of projection in decimal degrees

PROPARM2: Latitude of center of projection in decimal degrees

PROPARM3: False easting in meters

PROPARM4: False northing in meters

Projection 12

PRONAME: "Azimuthal Equidistant"

PROCNTI: 0

PROCNTR: 4

PROPARM1: Longitude of center of projection in decimal degrees

PROPARM2: Latitude of center of projection in decimal degrees

PROPARM3: False easting in meters

PROPARM4: False northing in meters

Projection 13

PRONAME: "Gnomonic"

PROCNTI: 0

PROCNTR: 4

PROPARM1: Longitude of center of projection in decimal degrees

PROPARM2: Latitude of center of projection in decimal degrees

PROPARM3: False easting in meters

PROPARM4: False northing in meters

Projection 14

PRONAME: "Orthographic"

PROCNTI: 0

PROCNTR: 4

PROPARM1: Longitude of center of projection in decimal degrees

PROPARM2: Latitude of center of projection in decimal degrees

PROPARM3: False easting in meters

PROPARM4: False northing in meters

Projection 15

PRONAME: "General Vertical Near-side Perspective"

PROCNTI: 0

PROCNTR: 5

PROPARM1: Height of perspective point above sphere in meters

PROPARM2: Longitude of center of projection in decimal degrees

PROPARM3: Latitude of center of projection in decimal degrees

PROPARM4: False easting in meters

PROPARM5: False northing in meters

Projection 16

PRONAME: "Sinusoidal"

PROCNTI: 0

PROCNTR: 3

PROPARM1: Longitude of central meridian in decimal degrees

PROPARM2: False easting in meters

PROPARM3: False northing in meters

Projection 17

PRONAME: "Equirectangular"

PROCNTI: 0

PROCNTR: 4

PROPARM1: Longitude of central meridian in decimal degrees

PROPARM2: Latitude of true scale in decimal degrees

PROPARM3: False easting in meters

PROPARM4: False northing in meters

Projection 18

PRONAME: "Miller Cylindrical"

PROCNTI: 0

PROCNTR: 3

PROPARM1: Longitude of central meridian in decimal degrees

PROPARM2: False easting in meters

PROPARM3: False northing in meter

PRNAME: "Modified Transverse Mercator"
PROCNTI: 0
PROCNTR: 2
PROPARM1: False easting in meters
PROPARM2: False northing in meters

Projection 23

Projection 24

PRONAME: "Robinson"
PROCNTI: 0
PROCNTR: 3
PROPARM1: Longitude of central meridian in decimal degrees
PROPARM2: False easting in meters
PROPARM3: False northing in meters

5.B.2 Spheroid and Datum Data

In Table III below, the columns: DX, DY, DZ, w, f, k, and ds are DATUM1 through DATUM7 respectively from Table II. These are the parameters as from DMA TR 8350.2

A DX value of “grid” specifies USGS National Geodetic Survey NADCON grid product.

A DX value of “regression” specifies DMA Multiple Regression Equations from DMA TR 8350.2

For all spheroids a datum of “NONE” is acceptable with DX, DY, DZ, w, f, k, and ds values all zero.

Table III. Spheroid and Datum Data

Spheroid	Semi-minor	Semi-major	Datum	DX	DY	DZ	w	f	k	ds
Clarke 1866	6378206.4	6356583.8	Bermuda 1957	-73	213	296	0	0	0	0
			Cape Canaveral	-2	151	181	0	0	0	0
			Guam 1963	-100	-248	259	0	0	0	0
			L. C. 5 Astro 1961	42	124	147	0	0	0	0
			Luzon	-133	-77	-51	0	0	0	0
			Luzon (Mindanao)	-133	-79	-72	0	0	0	0
			NAD27	grid						
			NAD27 (CONUS)	-8	160	176	0	0	0	0
			NAD27 (CONUS) (MRE)	regression						
			NAD27 (East CONUS)	-9	161	179	0	0	0	0
			NAD27 (West CONUS)	-8	159	175	0	0	0	0
			NAD27 (Alaska)	-5	135	172	0	0	0	0
			NAD27 (Bahamas)	-4	154	178	0	0	0	0
			NAD27 (San Salvador Island)	1	140	165	0	0	0	0
			NAD27 (Canada)	-10	158	187	0	0	0	0
			NAD27 (Canada) (MRE)	regression						
			NAD27 (Canada_AB)	-7	162	188	0	0	0	0
			NAD27 (Canada_MO)	-9	157	184	0	0	0	0
			NAD27 (Canada_NNNQ)	-22	160	190	0	0	0	0
			NAD27 (Canada_NS)	4	159	188	0	0	0	0
			NAD27 (Yukon)	-7	139	181	0	0	0	0
			NAD27 (East Central America)	-3	142	183	0	0	0	0
			NAD27 (West Central America)	0	125	194	0	0	0	0
			NAD27 (Canal Zone)	0	125	201	0	0	0	0
			NAD27 (Cuba)	-9	152	178	0	0	0	0
			NAD27 (Greenland)	11	114	195	0	0	0	0
			NAD27 (Mexico)	-12	130	190	0	0	0	0
			Old Hawaiian	61	-285	-181	0	0	0	0
			Old Hawaiian (Hawaii)	89	-279	-183	0	0	0	0
			Old Hawaiian (Kauai)	45	-290	-172	0	0	0	0

			Old Hawaiian (Maui)	65	-290	-190	0	0	0	0
			Old Hawaiian (Oahu)	58	-283	-182	0	0	0	0
			Puerto Rico	11	72	-101	0	0	0	0
Clarke 1880	6378249.145	6356514.86955								
			Adindan	-166	-15	204	0	0	0	0
			Adindan (Burkina Faso)	-118	-14	218	0	0	0	0
			Adindan (Cameroon)	-134	-2	210	0	0	0	0
			Adindan (Ethiopia)	-165	-11	206	0	0	0	0
			Adindan (Mali)	-123	-20	220	0	0	0	0
			Adindan (Senegal)	-128	-18	224	0	0	0	0
			Adindan (Sudan)	-161	-14	205	0	0	0	0
			Antigua Island Astro 1943	-270	13	62	0	0	0	0
			Arc 1950	-143	-90	-294	0	0	0	0
			Arc 1950 (Botswana)	-138	-105	-289	0	0	0	0
			Arc 1950 (Burundi)	-153	-5	-292	0	0	0	0
			Arc 1950 (Lesotho)	-125	-108	-295	0	0	0	0
			Arc 1950 (Malawi)	-161	-73	-317	0	0	0	0
			Arc 1950 (Swaziland)	-134	-105	-295	0	0	0	0
			Arc 1950 (Zaire)	-169	-19	-278	0	0	0	0
			Arc 1950 (Zambia)	-147	-74	-283	0	0	0	0
			Arc 1950 (Zimbabwe)	-142	-96	-293	0	0	0	0
			Arc 1960	-160	-6	-302	0	0	0	0
			Ayabelle Lighthouse	-79	-129	145	0	0	0	0
			Cape	-136	-108	-292	0	0	0	0
			Carthage	-263	6	431	0	0	0	0
			Dabola	-83	37	124	0	0	0	0
			Fort Thomas 1955	-7	215	225	0	0	0	0
			Leigon	-130	29	364	0	0	0	0
			Liberia 1964	-90	40	88	0	0	0	0
			M'Poraloko	-74	-130	42	0	0	0	0
			Mahe 1971	41	-220	-134	0	0	0	0
			Merchich	31	146	47	0	0	0	0
			Minna (Cameroon)	-81	-84	115	0	0	0	0
			Minna (Nigeria)	-92	-93	122	0	0	0	0
			Montserrat Island Astro 1958	174	359	365	0	0	0	0
			Nahrwan (Oman)	-247	-148	369	0	0	0	0
			Nahrwan (Saudi Arabia)	-243	-192	477	0	0	0	0
			Nahrwan (United Arab Emirates)	-249	-156	381	0	0	0	0
			Oman	-346	-1	224	0	0	0	0
			Point 58	-106	-129	165	0	0	0	0
			Pointe Noire 1948	-148	51	-291	0	0	0	0
			Viti Levu 1916	51	391	-36	0	0	0	0
Bessel	6377397.155	6356078.96284								
			Bukit Rimpah	-384	664	-48	0	0	0	0
			Djakarta (Batavia)	-377	681	-50	0	0	0	0
			Gunung Segara	-403	684	41	0	0	0	0
			Massawa	639	405	60	0	0	0	0
			Tokyo	-148	507	685	0	0	0	0
			Tokyo (Korea)	-146	507	687	0	0	0	0

			Tokyo (Okinawa)	-158	507	676	0	0	0	0
New International 1967	6378157.5	6356772.2								
International 1909	6378388.0	6356911.94613								
		Ain el Abd 1970 (Bahrain)	-150	-251	-2	0	0	0	0	0
		Ain el Abd 1970 (Saudi Arabia)	-143	-236	7	0	0	0	0	0
		Ascension Island 1958	-191	103	51	0	0	0	0	0
		Astro Beacon E 1945	145	75	-272	0	0	0	0	0
		Astro DOS 71/4	-320	550	-494	0	0	0	0	0
		Astro Tern Island (FRIG) 1961	114	-116	-333	0	0	0	0	0
		Astronomical Station 1952	124	-234	-25	0	0	0	0	0
		Bellevue (IGN)	-127	-769	472	0	0	0	0	0
		Bissau	-173	253	27	0	0	0	0	0
		Bogota Observatory	307	304	-318	0	0	0	0	0
		Camp Area Astro	-104	-129	239	0	0	0	0	0
		Campo Inchauspe	-148	136	90	0	0	0	0	0
		Campo Inchauspe (MRE)	regression							
		Canion Astro 1966	298	-304	-375	0	0	0	0	0
		Chatham Island Astro 1971	175	-38	113	0	0	0	0	0
		Chua Astro	-134	229	-29	0	0	0	0	0
		Corrego Alegre	-206	172	-6	0	0	0	0	0
		Corrego Alegre (MRE)	regression							
		DOS 1968	230	-199	-752	0	0	0	0	0
		Easter Island 1967	211	147	111	0	0	0	0	0
		European 1950	-87	-98	-121	0	0	0	0	0
		European 1950 (Cyprus)	-104	-101	-140	0	0	0	0	0
		European 1950 (Egypt)	-130	-117	-151	0	0	0	0	0
		European 1950 (Finland Norway)	-87	-95	-120	0	0	0	0	0
		European 1950 (Greece)	-84	-95	-130	0	0	0	0	0
		European 1950 (Iran)	-117	-132	-164	0	0	0	0	0
		European 1950 (Malta)	-107	-88	-149	0	0	0	0	0
		European 1950 (Middle East)	-103	-106	-141	0	0	0	0	0
		European 1950 (Portugal Spain)	-84	-107	-120	0	0	0	0	0
		European 1950 (Sardinia)	-97	-103	-120	0	0	0	0	0
		European 1950 (Sicily)	-97	-88	-135	0	0	0	0	0
		European 1950 (UK Ireland)	-86	-96	-120	0	0	0	0	0
		European 1950 (West Europe)	-87	-96	-120	0	0	0	0	0
		European 1950 (West Europe) (MRE)	regression							
		European 1979	-86	-98	-119	0	0	0	0	0
		GUX 1 Astro	252	-209	-751	0	0	0	0	0
		Gan 1970	-133	-321	50	0	0	0	0	0
		Geodetic Datum 1949	84	-22	209	0	0	0	0	0
		Graciosa Base SW 1948	-104	167	-38	0	0	0	0	0
		Herat North	-333	-222	114	0	0	0	0	0
		Hjorsey 1955	-73	46	-86	0	0	0	0	0
		Hong Kong 1963	-156	-271	-189	0	0	0	0	0
		Hu-Tzu-Shan	-637	-549	-203	0	0	0	0	0

			ISTS 061 Astro 1968	-794	119	-298	0	0	0	0
			ISTS 073 Astro 1969	208	-435	-229	0	0	0	0
			Johnston Island 1961	189	-79	-202	0	0	0	0
			Kerguelen Island 1949	145	-187	103	0	0	0	0
			Kusaie Astro 1951	647	1777	-1124	0	0	0	0
			Midway Astro 1961	912	-58	1227	0	0	0	0
			Naparima BWI	-10	375	165	0	0	0	0
			Observatorio Metereo. 1939	-425	-169	81	0	0	0	0
			PSAD56	-288	175	-376	0	0	0	0
			PSAD56 (Bolivia)	-270	188	-388	0	0	0	0
			PSAD56 (Colombia)	-282	169	-371	0	0	0	0
			PSAD56 (Ecuador)	-278	171	-367	0	0	0	0
			PSAD56 (Guyana)	-298	159	-369	0	0	0	0
			PSAD56 (North Chile)	-270	183	-390	0	0	0	0
			PSAD56 (Peru)	-279	175	-379	0	0	0	0
			PSAD56 (South Chile)	-305	243	-442	0	0	0	0
			PSAD56 (Venezuela)	-295	173	-371	0	0	0	0
			Pico de las Nieves	-307	-92	127	0	0	0	0
			Pitcairn Astro 1967	185	165	42	0	0	0	0
			Porto Santo 1936	-499	-249	314	0	0	0	0
			Provisional S. Chilean 1963	16	196	93	0	0	0	0
			Qatar National	-128	-283	22	0	0	0	0
			Qornoq	164	138	-189	0	0	0	0
			Reunion	94	-948	-1262	0	0	0	0
			Rome 1940	-225	-65	9	0	0	0	0
			Santo (DOS) 1965	170	42	84	0	0	0	0
			Sao Braz	-203	141	53	0	0	0	0
			Sapper Hill 1943	-355	21	72	0	0	0	0
			Selvagem Grande	-289	-124	60	0	0	0	0
			Tananarive Observatory 1925	-189	-242	-91	0	0	0	0
			Tristan Astro 1968	-632	438	-609	0	0	0	0
			Wake Island Astro 1952	276	-57	149	0	0	0	0
			Yacare	-155	171	37	0	0	0	0
			Zanderij	-265	120	-358	0	0	0	0
WGS 72	6378135.0	6356750.519915								
			WGS 72	0	0	4.5	0	0	-2.686e-06	2.2e-07
Everest	6377276.3452	6356075.4133								
			Indian (Bangladesh)	282	726	254	0	0	0	0
			Indian 1954	218	816	297	0	0	0	0
			Indian 1975	209	818	290	0	0	0	0
			Kandawala	-97	787	86	0	0	0	0
WGS 66	6378145.0	6356759.769356								
			NWL9D	0	0	4.5	0	0	-3.946e-06	-6.0e-07
GRS 1980	6378137.0	6356752.31414								
			NAD83		grid					
			NAD83 (DMA)	0	0	0	0	0	0	0
			HARN		grid					
Airy	6377563.396	6356256.91								
			Ord. Survey G. Britain 1936	375	-111	431	0	0	0	0
			Ord. Survey G. Britain 1936	371	-112	434	0	0	0	0

			(England)									
			Ord. Survey G. Britain 1936 (England Wales)				371	-111	434	0	0	0
			Ord. Survey G. Britain 1936 (Scotland Shetland)				384	-111	425	0	0	0
			Ord. Survey G. Britain 1936 (Wales)				370	-108	434	0	0	0
Modified Everest	6377304.063	6356103.039										
			Kertau 1948				-11	851	5	0	0	0
Modified Airy	6377341.89	6356036.143										
Walbeck	6376896.0	6355834.8467										
Southeast Asia	6378155.0	6356773.3205										
Australian National	6378160.0	6356774.719										
			Anna 1 Astro 1965				-491	-22	435	0	0	0
			Australian Geodetic 1966				-133	-48	148	0	0	0
			Australian Geodetic 1966 (MRE)				regression					
			Australian Geodetic 1984				-134	-48	149	0	0	0
			Australian Geodetic 1984 (MRE)				regression					
Krasovsky	6378245.0	6356863.0188										
			Afgooye				-43	-163	45	0	0	0
Hough	6378270.0	6356794.343479										
			Wake-Eniwetok 1960				102	52	-38	0	0	0
Mercury 1960	6378166.0	6356784.283666										
Modified Mercury 1968	6378150.0	6356768.337303										
Sphere of Radius 6370997m	6370997.0	6370997.0										
WGS 84	6378137.0	6356752.31424517929										
			BTS87	0.071	-0.509	-0.166	-8.678e-08	2.424e-09	3.248e-08			-1.7e-08
Helmer	6378200.0	6356818.16962789092										
			Old Egyptian 1907				-130	110	-13	0	0	0
Sphere of Nominal Radius of Earth	6370997.0	6370997.0										
Airy Modified 1849	6377340.189	6356034.4479										
			Ireland 1965				506	-122	611	0	0	0
Bessel (Namibia)	6377483.865	6356165.383										
			Schwarzeck				616	97	-251	0	0	0
Everest	6377301.243	6356100.2284										

1956										
			Indian (India Nepal)	295	736	257	0	0	0	0
Everest 1969	6377295.664	6356094.6679								
Everest (Sabah & Sarawak)	6377298.556	6356097.5503								
			Timbalai 1948	-679	669	-48	0	0	0	0
Fischer 1960	6378166.0	6356784.2836								
Modified Fischer 1960	6378155.0	6356773.3205								
			South Asia	7	-10	-26	0	0	0	0
Fischer 1968	6378150.0	6356768.3372								
SGS 85	6378136.0	6356751.3016								
			SGS 85	3	9	-9	0	0	0	0
South American 1969	6378160.0	6356774.7192								
			SAD69	-57	1	-41	0	0	0	0
			SAD69 (Argentina)	-62	-1	-37	0	0	0	0
			SAD69 (Baltra Galapagos)	-47	27	-42	0	0	0	0
			SAD69 (Bolivia)	-61	2	-48	0	0	0	0
			SAD69 (Brazil)	-60	-2	-41	0	0	0	0
			SAD69 (Chile)	-75	-1	-44	0	0	0	0
			SAD69 (Colombia)	-44	6	-36	0	0	0	0
			SAD69 (Ecuador)	-48	3	-44	0	0	0	0
			SAD69 (Guyana)	-53	3	-47	0	0	0	0
			SAD69 (Paraguay)	-61	2	-33	0	0	0	0
			SAD69 (Peru)	-58	0	-44	0	0	0	0
			SAD69 (Trinidad Tobago)	-45	12	-33	0	0	0	0
			SAD69 (Venezuela)	-45	8	-33	0	0	0	0
			SAD69 (MRE)	regression						
Sphere	6371000.0	6371000.0								

5.B.3 Units of Measure

Each entry in Table IV is the conversion factor to the "standard unit" of meters.

Table IV. Units Of Measure Conversion Factors

To Convert To Meters From	Factor
meters	1.0
meter	1.0
m	1.0
centimeters	0.01
centimeter	0.01
cm	0.01
millimeters	0.001
millimeter	0.001
mm	0.001
kilometers	1000.0
kilometer	1000.0
km	1000.0
other	1.0
The following 3 items are U.S. Survey foot.	
feet	0.3048006096012192
foot	0.3048006096012192
ft	0.3048006096012192
The following 14 items are related to Standard foot (0.3048).	
inches	0.3048 / 12.0
inch	0.3048 / 12.0
in	0.3048 / 12.0
points	0.3048 / 12.0 / 72.0
point	0.3048 / 12.0 / 72.0
pt	0.3048 / 12.0 / 72.0
yards	3*0.3048
yard	3*0.3048
yd	3*0.3048
miles	5280*0.3048
mile	5280*0.3048
mi	5280*0.3048
	1852.0
	0.3048 / 12.0 / 300.0